Essays on rural household decision-making under climate risk

SUMMARY

In the poverty reduction discourse, a growing attention has been devoted to correctly include considerations related to rural households' capacity to adequately manage climate risks. The introductory chapter highlights that some of the households' decisions and behavioural responses to uninsured climate risks further deepen poverty. It also reflects on the greatest development challenge that most countries in sub-Saharan Africa are currently facing related to lack of resilience of rural households to climate change and variability. In this respect, the overarching aim of this dissertation is to provide empirical evidence that can inform the design of programme and policy interventions intending to enhance rural households' capacity to take coping and adaptive responses to climate risks without sacrificing their investments on human, physical and natural capital. To this end, the three empirical chapters examine rural households' behavioural responses and decisions to better understand the impact pathways in the climate risk–welfare nexus and identify policy-related drivers for the adoption of climate-smart agricultural innovations and high-risk high-return agricultural technologies.

In Chapter 2, we link child-level longitudinal data from the Ethiopia Rural Socioeconomic Survey (ERSS) to high-resolution gridded climate data to examine the impact of climate shocks on human capital of school-age children. The results from panel regression models reveal that drought shocks have a detrimental impact on child health and schooling outcomes. Child illness is a significant mediating factor through which drought negatively affects the highest completed years of formal education. The direct and indirect (mediated) effects of drought on child schooling are disproportionately concentrated among girls. Further analyses to unpack the mechanisms show that rural households respond to drought shocks by decreasing resources allocated towards the health care of female children and relying on female child labour for non-agricultural activities. This dissertation adds to the evidence base on the climate risks-welfare nexus by investigating the gendered impact of drought-induced income shocks on human capital formation using child-level analysis. It also contributes to the literature on gender inequality in human development by examining how

gender bias in the intrahousehold resource allocation and use introduces heterogeneity in the direct and indirect effects of climate shocks on child human capital.

Chapter 3 elicits rural households' preferences for the uptake of agricultural innovations that potentially serve both climate risk adaptation and mitigation functions. A discrete choice experiment was conducted with rural households in Ethiopia to elicit their willingness to participate in a market-based environmental management scheme broadly known as payments for ecosystem services (PES) that incentivises climate-smart agroforestry. The study addresses individual- and class-specific preference heterogeneities using generalized multinomial logit and latent class conditional logit models, respectively. The results show that households derive higher utility from up-front PES payments for planting fertilizer trees. Households also strongly prefer food as the mode of payment than cash. Moreover, low numbers of mandatory planted trees and short-term contracts are found to be essential attributes of the PES scheme that can positively influence the uptake of PES contracts for growing trees on agricultural land. The results shed light on the design considerations that must be taken into account for integrating efficiency and equity objectives in PES schemes so that vulnerable rural households can be accommodated and encouraged to practice environmentally conscious land use. The study is a novel contribution to the PES literature as the design features of the scheme allow payments starting from the initial year, as opposed to conventional PES programs that pay after the ecosystem services are realized.

Chapter 4 examines the impact of rural households' uptake of weather index-based crop insurance (WICI) on their risk-aversion. This Chapter contributes to the existing literature on the causes of change in risk preferences by providing valuable insight into the structural relationship between a programme intervention that facilitates access to WICI market and farmers' risk-aversion. We collected survey and experimental data from rural households that have access to WICI in Ethiopia. The study employed the endogenous switching probit (ESP) model to address self-selection and simultaneity biases. Results from the ESP model show that farmers who purchased WICI are less likely to be risk-averse compared with non-purchasers. Similarly, non-purchasers would have attained a significant reduction in their risk-aversion if they had taken up the insurance product. We also find evidence that WICI uptake positively influences farmers' real-life risk-taking behaviour as exemplified by their decision to use mineral fertilizer. Therefore, the role of climate risk management policies and strategies in general and WICI in particular in the poverty alleviation and economic development can also be channelled through their effects on risk preferences.

Chapter 5 concludes by drawing final remarks and forwarding policy recommendations. It also highlights the study limitations and suggests potential avenues for further research.